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CHINA REPORT

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SHANGHAI TECHNOLOGY BENEFITS INLAND REGIONS

OW121045 Beijing XINHUA Domestic Service in Chinese 1148 GMT 8 Oct 83

[Excerpts] Beijing, 8 Oct (XINHUA)--Our XINHUA reporter has learned from the Beijing International Forum on Science, and Technology Policy and Management that Shanghai has transferred more scientific and technological achievements to China's inland in recent years. From 1979 to the first half of 1983, Shanghai let China's inland areas use the results of its scientific and technological achievements on 1,100 occasions, accepted over 1,500 assignments from various localities to carry out experiments in scientific research, offered various technical services on more than 1,200 occasions and set up over 240 joint technical and economic organs of all types with various localities in inland areas.

In the course of developing economic construction, more and more comrades in China's inland areas have come to realize that to make good use of the technical developments in Shanghai and other cities is one of the most effective measures in spurring the inland economy. They have called this practice the "import of technology without using foreign exchange."

Now a new situation has prevailed in the transfer of technology from Shanghai to China's inland areas.

1. Such transfer of technology has been carried out in an organized manner, with official organizations taking up the matter instead of letting organizations or enterprises contact each other privately. When the Shanghai Municipal Meeting for Scientific and Technological Cooperation and Exchanges was held in the spring of last year, more than 600 units, led by their leading comrades, from 28 provinces, municipalities and autonomous regions, attended the meeting for consultations in the field of science and technology, and had 125 scientific programs transferred for their own use.

2. The transfer of technology varies from the transfer of a single project to comprehensive cooperation between the two sides.

3. The transfer of technology has been developed from short-term and temporary agreements to long-term and regular contacts. This year, the number of contracts signed between Shanghai's Institutions of Higher Learning Science and Technology Service Center and various localities in China's inland has been increased by 50 percent compared with last year.

4. Such transfer of technology has now been carried out between one region and another, instead of between one unit and another. Regular relations of cooperation have been established between Shanghai and Ningxia Hui Autonomous Region. In the past few years, both sides have developed 115 programs for cooperation. In addition, Shanghai has trained 425 technicians of all categories for Ningxia, and sent out more than 60 technicians to render technical services in Yingchuan City.

CSO: 4008/37

SHANXI, SCIENCE ACADEMY SIGN PROTOCOL

HK140311 Taiyuan Shanxi Provincial Service in Mandarin 2300 GMT 13 Oct 83

[Text] The provincial government and the Academy of Sciences signed a protocol on scientific and technical cooperation in Taiyuan on 13 October. The procotol is on scientific and technical cooperation for the construction of energy, heavy, and chemical industry bases, and for development. Academy of Science Secretary-General (Gu Yijian) and Provincial Government Secretary-General Wang Zhende signed the protocol and made speeches.

This protocol was signed on the basis of the guiding idea that economic construction must rely on science and technology, and science and technology must be geared to economic construction. It involves practicing voluntary cooperation, bringing superior features into play, promoting mutual benefit, and making greater contributions. Long-term and stable cooperation will be practiced in the relevant branches of science and technology. It is the first technical cooperation protocol that the Academy of Science has signed with a province or municipality.

Following the signing of the protocol, the Academy of Science will in various ways provide comprehensive and large-scale fruits of science and technology covering extensive fields, in order to speed up the development of science and technology in the province, promote the construction of bases, and improve economic and social results. It will serve the economic development of Shanxi and the effort to build Shanxi into a modern energy, heavy, and chemical industry base.

Present at the signing were Zhang Sai, member of the provincial CPC committee Standing Committee, and Zhang Weiqing, vice governor. Also present were over 200 representatives of experts attending the conference on popularizing the fruits of science and technology jointly convened by the Academy of Science and the Shanxi Government.

CSO: 4008/37

NATIONAL DEVELOPMENTS

BRIEFS

SHANXI SCIENCE, TECHNOLOGY COOPERATION--The conference on scientific and technological cooperation and popularization of scientific and technological achievements jointly held by the Shanxi Provincial People's Government and the China Academy of Sciences concluded in Taiyuan on 17 October. At this conference, through negotiation and consultation, the provincial people's government and the China Academy of Sciences signed a protocol on scientific and technological cooperation. They arrived at 38 agreements on scientific and technological cooperation and popularization of scientific and technological achievements. The conference decided that in the future, the province will provide necessary assistance in building energy bases. At the conference, a scientific and technological cooperation and coordination leadership group of the Shanxi provincial government and the China Academy of Sciences was established. [Summary] [HK191456 Taiyuan Shanxi Provincial Service in Mandarin 2300 GMT 17 Oct 83 HK]

CSO: 4008/37

APPLIED SCIENCES

XINJIANG SCIENTISTS MAP OUT RESEARCH PLANS

HK210348 Urumqi Xinjiang Regional Service in Mandarin 1300 GMT 20 Oct 83

[Text] The Xinjiang branch of the Academy of Science has seriously implemented the strategic ideas of the Central Committee and State Council on developing Xinjiang and the Great Northwest. Since its revival in 1978, the branch has scored 147 scientific research results in various fields including controlling deserts, improving alkaline land, improving grassland, carrying out comprehensive scientific investigations of resources in barren land, and researching energy. These have contributed to building Xinjiang.

Recently, in accordance with the instructions of leading central comrades and the actual conditions of the branch academy, the staff have held special meetings and proposed to make preparations in 10 aspects for developing Xinjiang. These 10 aspects are as follows:

1. Organize forces to continue to carry out comprehensive investigation of natural resources in the Tian, Altai, and Kunlun Shan [Mountains] and the Tarim, Junggar, and Turpan basins, to provide data for development and utilization. At the same time, work out plans and schemes for comprehensive harnessing of the Ertix, Yili, Kax, Tarim, and Hetian He [rivers].

2. Continue to carry out research in sand harnessing in order to control shifting sand in the Junggar basin and the southern plain of the Tarim basin and protect the green corridor along the lower reaches of the Tarim He.

3. Organize specialized researchers in biology, geology and so on to carry out research in improving alkaline land.

4. Vigorously launch experiments in improving grassland, set up sample experiments in modern artificial grassland, develop [words indistinct] fodder, develop fine strains of livestock, and carry out research in preventing and treating livestock diseases.

5. Develop biological technical research and apply various new techniques to cultivate new fine-strain disease-resistant cucurbit and fruit. At the same time, launch research in the safe storage of cucurbit and fruit.

6. Carry out research into the use of solar energy. Concentrate forces to develop solar stoves, small solar energy power generation installations, and solar energy power installations for industrial use.

7. Carry out in-depth research in oil structural geology, and promote research in deep extraction and in processing.

8. Carry out research in preventing and treating agriculture and forestry plant diseases and insect pests.

9. Use electronic and automation technology to carry out transformation in the enterprises and improve productivity. At the same time, vigorously popularize advanced technology and the fruits of research.

10. Carry out research in meteorological physics.

CSO: 4008/39

UN RIVER SEDIMENTATION RESEARCH CENTER PLANNED

OW120827 Beijing XINHUA in English 0750 GMT 12 Oct 83

[Text] Nanjing, 12 Oct (XINHUA)--UNESCO will give financial support for setting up a river sedimentation research center in Beijing, this is announced by S. Dumitrescu, head of the UNESCO Water Sciences Division, at the opening yesterday of the Second International Symposium on River Sedimentation in Nanjing, east China.

Chinese scholars suggested that the center be set up at the First International Symposium on River Sedimentation held in Beijing in April 1980. Attending are 200 specialists from more than 20 countries on five continents.

The symposium is sponsored by the Chinese Society of Hydraulic Engineering and the Chinese Committee of the International Hydrological Program, with the support of UNESCO and the United Nations development program.

During the six-day symposium, the participants will present 107 papers including 49 by the Chinese scientists, focusing on sediment transport mechanics, sediment movement, fluvial processes, river course realignment, model tests of sediment transport and field measuring techniques.

River sedimentation is closely related to port and dam construction, navigation, power-generating and water irrigation.

China has attached great importance to river sedimentation research. Some 1,000 scientists in the country are now doing such work. China's Yellow River is among the most heavily silted in the world, carrying 40 kilograms per cubic meter and the Yangtze River annually carries away 400 to 500 million tons of silt.

Beijing-based Qinghua University has a sand laboratory for the study of sand sedimentation and control in the Yellow and Yangtze Rivers.

CSO: 4010/4

BRIEFS

DATA COMMUNICATIONS STANDARDS--Tianjin, 29 Sep (XINHUA)--China is working out national standards for data communications and preparing to establish computer networks to improve its communications system. This was revealed by Chinese delegates attending the Twentieth Annual Meeting of the Data Communications Sub-Committee of the Information Processing Systems Technology Committee of the International Organization for Standardization now in session here. China's character-oriented data communications control procedure will be published 1 October, the meeting was told, and high-level data link control procedure is being drafted. The international meeting would help China in its efforts to modernize the country's communications system, experts said. The international meeting, at the invitation of the China Association for Standardization, was attended by 84 delegates from 13 countries including Australia, Canada, France, Federal Germany, Japan, United Kingdom, the United States and China and four international organizations concerned. The Chinese delegation has submitted four papers to the meeting, which will close at the end of this month. [Text] [OW291214 Beijing XINHUA in English 1128 GMT 29 Sep 83]

XINJIANG STANDARDIZATION MEETING HELD--The first cooperation meeting on standardization attended by five northwest provinces and autonomous regions was recently held in Urumqi. The meeting discussed matters on strengthening standardized technical cooperation, interchanging standard information, technical transmission, and making contributions to the development and building of the Great Northwest. [Text] [Urumqi Xinjiang Regional Service in Mandarin 1300 GMT 18 Oct 83 HK]

CSO: 4008/31

PROFESSOR ZHU XIANYI DISCUSSES REFORM OF MEDICAL EDUCATION

Tianjin KEXUE XUE YU KEXUE JISHU GUANLI /SCIENTIOLOGY AND THE MANAGEMENT OF SCIENCE AND TECHNOLOGY/ in Chinese No 6, 1983 pp 32-33

/Article by Li Daxiong /2621 1129 7160/ and Yang Yigong /2799 0001 1562/ /

/Text/ On two occasions, 6 and 14 March 1983, we visited China's famous endocrinologist, educator and president of Tianjin Medical College, Professor Zhu Xianyi /2612 2009 1744/. We asked him to discuss his views regarding and conceptions of the reform of medical education in general and his college in particular. As an educator and medical scientist Professor Zhu is a rigorous scholar, his medical skills enjoy wide renown and he has much insight into the management of a medical college. He established Tianjin Medical College singlehandedly, and no matter how much interference he has suffered over the last 30-odd years, this college has continued its advance, to which Professor Zhu has contributed much effort. Thus, when discussing how medical colleges should be reformed in order to meet the needs of the four modernizations, Professor Zhu is very emphatic. His many opinions are very frank, valuable and merit our attention.

1. Reform of Leadership Is Key to Reform

Professor Zhu notes that discussion of reform is widespread and that a wave of reform is sweeping the country. Our medical college, he says, also discusses reform every day, but what is the key to reform? "In my view the key is leadership. If leadership is not reformed properly, a restructuring of the middle ranks will never resolve problems. I have read your magazine, KEXUE XUE YU KEXUE JISHU GUANLI, and while I do not know anything about management, I do know that 'subordinates follow the example of their superiors.' Whatever the superiors do, their subordinates will emulate. This is quite correct. For if leaders set good examples, things below will be much easier to handle.

"I am almost 80 years old and I have long yearned to retire from administrative work. I am a medical worker, and there is much medical research that needs to be done. Time does not wait for man. Before retiring, I would like to undertake some reform of the medical college. Only then can I rest in peace. But what should we reform? I believe that strengthening the development of hospitals affiliated with medical colleges is extremely important to medical education. At present, such hospitals suffer from many shortcomings in the training of

medical scientists. Medical colleges have basic and clinical courses, the latter of which require experienced doctors to teach them conscientiously. Thus hospitals affiliated with medical colleges must engage in both treatment and teaching. It is, therefore, incumbent on leadership to understand both education and medical treatment. The chief difference between regular and affiliated hospitals lies in the term 'affiliated.' People who do not understand education can still lead and manage regular hospitals. But such people would be very unsuited to direct affiliated hospitals. Currently there are some problems in the management and guiding ideology of Tianjin Medical College's two affiliated hospitals. If it is believed that reform means stressing economic results, then there will be insufficient stress on the training of interns at medical colleges. The leaders of affiliated hospitals must not fill their minds only with "money" and narrowly seek profits and outpatient volume. I believe that leaders of affiliated hospitals must give prior consideration to the training of qualified graduates, producing more results in medical research and assuming leadership roles in academic research among medical units. Educational work in medicine and health differs from that of industry and agriculture in that the training period for medical scientists is longer. Leading comrades in every field must recognize this distinction. Affiliated hospitals are important components of medical education, and thus they must first serve the needs of education. In the area of medical practice they must formulate detailed plans, methods, policies, standards of evaluation and the like. Our reform of medical education consists of assigning to leadership posts in affiliated hospitals comrades who truly have experience, knowledge, ability and interest in training medical scientists. Is it not true that your journal frequently carried articles discussing 'top priorities' and matters 'urgently requiring resolution'? Well, this matter is an urgent priority in the reform of medical educaiton. The readjustment and reform of leadership must be stressed and must have urgency. If the state does not manage medical colleges, then that is the end of it. But if it does manage them, it must give consideration to the problems of affiliated hospitals and clinical instruction. Thus the best hospitals ought to be turned into affiliated hospitals. Affiliated hospitals are not independent. Rather, they are inseparable components of medical colleges and must be brought under the unified leadership of the latter. In accordance with the three levels of medical treatment, affiliated hospitals handle difficult and complicated cases and thus differ entirely from regular hospitals. Purely to stress outpatient volume is to waste medical education.

"I did not conjure up these opinions on reform during a single brainstorm. I have derived them through a summarization of our predecessors' experiences, from the repeated practices of many countries and from 'lessons from the over-turned cart up ahead.' Reform will surely be implemented and achieve even greater urgency. Now, however, many comrades who have earned reputations for being safe and reliable say they oppose rash policies, but in fact they are 'firmly entrenched at Diaoyutai.' They dare not budge if the central government says nothing. Instead they wait. This is not the spirit of reform; it is irresponsible. The central leaders would be exhausted if in a country as big as ours every matter had to await their word. This type of thinking is impractical. To digress for the moment, some departments under our medical college take immediate breaks in their work as soon as their 'big chiefs' leave. This an absolutely baffling phenomenon. Scholars abroad also have meetings to

attend, and some are even absent most of the year. Yet their work at home does not cease. On their return, they engage in investigative and planning work, and when they leave again they always have new results to take with them. If research work can be done this way, then it will be vigorous. The key is having a capable core staff that can continue its work no matter whether the experts are present or not. In this fashion, the advance of science will be rapid and work will be easier. Thus we must not neglect ideological work among average cadres in order to raise their political consciousness and their sense of responsibility.

2. We Must Properly Employ Returned Students

"In the past few years we have sent many people abroad to study, the purpose of which is to conduct furhter investigation and study and nurture sophisticated scientific talent. Consequently, we must emphasize giving full play to the roles of these people in scientific research. When we send people abroad, we must preserve the completeness of the policy and not dismember it. Otherwise our efforts will be wasted.

"Many students and researchers have written numerous articles during their 2- or 3-year residence abroad. But on their return many of these people have been unable to produce results. What is the problem? It is not purely a question of facilities, because many people have proved unproductive due to improper assignments and employment. Many hospitals reassign returned researchers, students and trainees to their original work. This will never do! We must not persist in having such persons merely see patients, do consulting work and be on duty. To employ these people properly, we must stress the problem of how to give full play to their roles in scientific research. We must create the conditions to enable these people to continue their research and to develop their own specialties. We can also make use of the fact that they all have had teachers abroad. We can invite these foreign teachers to visit China to see how our researchers and students have performed since returning home, so that the latter can continue to receive guidance from their former foreign teachers. If our researchers and returned students can continue to publish two or three articles every 2 or 3 years as they did abroad, then our medical research work will advance rapidly.

3. Medical Journals Must Be Run Properly

"Currently there has been a large increase in the number of China's medical journals, and this is good. It will benefit the four modernizations and the exchange of experience. In medicine previously only ZHONGGUO YIXUE /CHINESE MEDICINE/, A JOURNAL PUBLISHED BY THE China Medical Association, was distributed abroad. Yet each issue contained only 10-odd articles. This does not adequately represent the state and level of development in China's medicine. At present, medical colleges everywhere are producing their own journals, and these fill part of the need. Yet unfortunately the number of periodicals published in foreign languages is insufficient. We should advocate publishing more foreign-language periodicals to improve our propaganda abroad, increase other nations' understanding of China, stimulate academic exchange and at the same time enhance the study and spread of foreign languages."

At the conclusion of our visit, Professor Zhu reiterated: "I am not a management expert, and what I have said is not necessarily correct. You should visit other comrades and hear opinions from all sides."

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CSO: 4008/173

LIFE SCIENCES

TEACHING BIOLOGY, TRAINING PERSONNEL STRESSED

Beijing SHENGLI KEXUE JINZHAN [PROGRESS IN PHYSIOLOGICAL SCIENCES] in Chinese No 3, Jul 83 pp 281-283

[Excerpts from an address to the Biology Council of the Chinese Academy of Sciences in December 1982 by Wang Kunren [3076 1024 0088], Biology Department, Beijing Teachers University: "The Teaching of Biology and the Nurturing of Talents"]

[Text] Strengthening the teaching of biology and nurturing a large number of talents specialized in this field will play an important role, be it for the construction of a high degree of material civilization or for the construction of a high degree of socialist spiritual civilization. I have collected some material, summed up certain opinions of our educational and scientific circles and added a few of my own personal views.

I. The General Structure and Trends of Educational Developments in Various Countries During the Last 30 Years

From the viewpoint of the historical development of science, there was no distinction between science and technology before the 16th century; by the 20th century, most of the industrial reforms originated in the achievements of the natural sciences. In the 19th century and in the early years of the 20th century, there was an interval of about 20 to 40 years from the time of a scientific invention to its application in production (e.g., it took 80 years from the invention of the steam engine to its practical application, 30 years from the invention of the radio to its being applied in actual production). However, in the last 50 years this interval was greatly shortened and at present is less than 4 to 5 years. It is therefore, a pressing necessity to raise the scientific and technological S&T level of the workers in order to have them speedily master the modern production technologies. Abroad, this set off educational reforms on a large scale during the last few years. These reforms have had the following special features: 1) diversification in the structure of higher education, operating schools of many different types to satisfy the needs of modern production and of society for talents of various grades and types; 2) emphasis on the development of talents and a concentration of energies on strengthening the education of research students to provide high-grade specialized talents for the daily growing S&T departments; 3) emphasis on basic courses and instruction in basic theories, paying attention to

broadening the basis; 4) in the setup of courses, a tendency toward "comprehensiveness," liberal arts courses and science courses to be mutually dovetailed and well integrated, with a number of interdisciplinary and peripheral courses; 5) emphasis on elective courses, introduction of a large number of flexible and varied elective courses; 6) paying attention to reforming the teaching methods, strengthening the students' ability for independent work and nurturing their ability for scientific research; 7) modernization of teaching methods. Quite a few countries are vigorously developing "electrified education," i.e., the full use of electrical audiovisual aids in education, such as motion pictures, slide projectors, television, sound recordings and videorecorders, thereby not only raising the instructional level at all types of schools, but also enabling a saving in teaching personnel and an increase in the number of students attending the courses.

II. Instruction in Biology

In the comprehensive universities of this country, the biology department is generally split into specialized areas. The plan of instruction in comprehensive universities generally gives attention to the following points: 1) strengthening of instruction in mathematics, physics and chemistry, in addition to which there are generally courses in physical chemistry. Some schools also list biological statistics and basic electronic (computer) calculations and language as required courses; 2) strengthening the courses in basic biology; 3) listing a large number of elective courses; 4) in the eighth term, there is generally scientific training or writing of a graduation thesis, for which at least 10 weeks are allowed.

Although biology courses in our middle schools have had to undergo many changes since liberation, in overall perspective it was still possible to achieve quite some successes, especially following the Third Plenary Session, when our leadership and our society began to pay increasing attention to biology, and quite some progress could be registered in actual work. The main problems that still exist at present are: In some areas there is still not sufficient attention paid to biological instruction, this field of instruction at times even being discriminated against; the plan of instruction shows an unjustifiably low number of hours of biological instruction, the general arrangement also not being very appropriate; the textbooks are exceedingly cramped and unsuitable for self-study; conditions for biological experiments are too deficient and require urgent improvements; the quality of the teaching personnel is very uneven, and there is a rather urgent need to raise their quality.

III. Some Important Problems Concerning Instruction in Biology and Nurturing of Talents in This Field

A. Problems of the Educational System and the Plan of Instruction

1. As to the educational system, we have now 4-year and 5-year systems in the biology departments of our universities; what, after all, would be an adequate length of university study? There are still differing views on this question, however, now that modern S&T advances in leaps and bounds and we see a veritable "knowledge explosion," it would seem more fitting for modern

requirements if the universities would decide on a 5-year study course. Otherwise, time would be too compressed for the many things to be taught, and what would be learned would not be sufficiently penetrating and thorough, or some things would be taught at the expense of other items. Some have figured that the total biological knowledge of 1960 is 4 times that of 1930, or 16 times that of 1900. Projecting at this speed of development, the total biological knowledge by the year 2000 will be 100 times that of 1900. It is, therefore, absolutely necessary to extend the study term, and this is indeed the fundamental reason why human education in general has to extend the years of education for all youths. This touches on an even more fundamental question, that is, the problem of our country's educational system. Some people believe that in order to catch up with, and surpass, such as the countries of Europe, America, Japan and the Soviet Union in their most advanced S&T, and in industrial and agricultural production and national defense, we must have an educational system that is more advanced than theirs, and they have, therefore, put forward the "5 times 5 system," namely 5 years each in elementary school, middle school, university and research institute, while the little child will be five when it ends nursery school. The advantages of the 5 times 5 system are: a) advancing the productive years and increasing the work output--if each person in our population of 1 billion enters school 2 years earlier, it would amount to an increase in total production or 2 billion workdays; b) an accelerated strengthening of scientific education, so that much basic instruction, originally being taught at the universities, could be relegated downward; c) it will not only be helpful in answering the question of how many years are to be spent in university, but also in selecting and nurturing outstanding talents because the university students will be mentally in their prime years. Of course this question is rather complex and awaits further experimentation and exploration in coordination with the realities of our country.

2. The problem of how to set up disciplines and specialized instruction. Looking at the present realities of our country, the setup of disciplines and specialized instruction must not be too narrow and too constricted. The departmental divisions in Soviet universities are very constricted, the advantage being that students can join specialized work immediately after graduation, but the disadvantage is that the base of their education is not broad enough and their vision remains rather narrow. They will not be fit to meet the demands from a greater variety of quarters. If their work assignment after graduation does not exactly fit their vocational training, their lack of a broadly based education will hardly make them suitable to meet the objective needs. Viewing the development of the disciplines per se, differentiation and comprehensiveness are the two trends that have complemented each other in the development of modern science. On the one hand, in line with the deepening of human knowledge of the objective world, there is a growing specialization and differentiation. On the other hand, scientific development demanded more and more a continuous synthesis of the diverse branches of knowledge, thus bringing forth many comprehensive disciplines and theories. How to deal adequately with the relation between these two aspects is an important question that higher education has to take into consideration. It seems that it would be most appropriate to have a broad foundation and on this foundation raise the educational pursuit in one particular field.

3. The question of curriculum and allotted hours. Based on the present developmental trend in biology and the many years of experience gathered in the educational practice of China and foreign countries, and for the purpose of laying a solid foundation, will it not generally be necessary, apart from an adequate strengthening of mathematics, physics and chemistry courses, to institute the following courses basic to biology in the specialized instructions in the biology departments: botany, zoology, biochemistry, microbiology, plant physiology, animal physiology, genetics, cytology, evolutionary biology and ecology.* The number of hours for each course need not be many, but it is mainly necessary to increase experiments. There must be a certain ratio between assigned electives and freely elective courses, which in general should be about 20 percent. The requirement of the graduation thesis should be retained, and the thesis should as far as possible be related with the scientific research of the professor. The time for its completion could be extended to 16 weeks, and it should be timed in the 10th study term.

B. The Problem of Nurturing Proper Study Methods Among the Students

As mentioned, modern science is developing very fast. The contradiction between the explosive increase in knowledge and the time available for studies cannot be fully resolved merely by extending the length of schooling. The most fundamental factor is to bring about a change in nurturing new study methods among the students. Today, our instruction of biology in certain universities and middle schools is still deeply influenced by traditional educational ideologies which only emphasize the transmission of knowledge and neglect nurturing the creative capabilities of the students. However, knowledge alone is not talent. Talent is the capability to scientifically process and creatively apply an abundant store of knowledge. To accomplish this it is necessary, in addition to having a large store of knowledge, to also master the methods of scientific thinking and gain proficiency in skills and techniques. A talented person has the capability of absorbing and accumulating knowledge and also of processing knowledge and applying it in practice. We must sum up the experiences and lessons of our past educational work, absorb everything valuable in foreign education, establish a proper relationship between the transmission of knowledge and the nurturing of capabilities and place our emphasis on the development of the student's intelligence and on nurturing their capabilities. Many people engaged in education believe that our education should nurture three capabilities in our students: One, the capability of acquiring knowledge independently. The knowledge that a person learns in school is very limited. The teacher's task is, on the other hand, to guide the student to "cross the threshold" and acquire a solid foundation in the subject concerned, but, more importantly, to nurture the student's capability and methods of independent study. Two, the capability to actually put his hands to a job and get it going.

*Biophysics, biochemistry and such specialized courses, for which only one "general biology" course may be listed (it must be assured a certain number of hours, there must be more experiments and also fieldwork) and microbiology, genetics, cytology and evolutionary biology may be changed to elective courses.

The present S&T development demands this capability to a higher degree and in more complex situations. Biology is a discipline of experimental science. If a person is deficient in taking action himself, he cannot very well perform experiments, not to speak of undertaking scientific research. Three, the capability to carry out scientific research, and this is to include the entire process of discovering a problem, conducting observations, testing, gathering data, ordering the material and data obtained, setting forth an assumption or hypothesis and proving by arguments and evidence.

If we want to have transmission of knowledge as well as emphasis placed on nurturing of capabilities, that means, of course, raising our demands on teachers. We must, therefore, first of all take the work of training good teacher material and raising the quality of our teachers firmly in hand. Next, we must compile a set of new teaching materials for the various biology courses; this material must be rich in content, meeting all demands, substantial in illustrations and text, excellently printed with clear explanations and suitable for self-study. We must gradually also provide the students with ample library material. We must see to it that teaching materials and reference books relevant to the subjects being taught are available in great variety. In this way, everybody will be able to help each other forward and gradually attain a higher level of proficiency. Finally, we must further enhance modernization of teaching methods, energetically replenish instruments and equipment and as far as possible open the laboratories and create the necessary conditions for the students to conduct scientific experiments.

C. The Problem of Building Up a Contingent of Qualified University Teachers

The building up of a contingent of qualified teachers is at present an extremely urgent task of great strategic significance. As to the present contingent of teachers at our institutions of higher learning, the main problems are: It is, on the one hand, a contingent of enormous numbers, personnel actually exceeding organizational needs, but, on the other hand, highly unreasonable in its composition, as if "the new crop is still in the blade, while the old crop is already consumed." As reported in the BAIKE ZHISHI [ENCLOPEDIC KNOWLEDGE] No 5 of 1982, the present teacher-student ratio in our universities is 1 to 4.3, and in the universities directly under the Ministry of Education it is 1 to 3.3. According to data prepared by UNESCO, it is 1 to 14 in the average present universities, it is 1 to 8 in England, in federal government-supported U.S. universities it is 1 to 20, in U.S. state universities 1 to 16.7, in France 1 to 20 and in Japan 1 to 19.3. Although we have this enormous number of teachers, the composition of this contingent is most unreasonable. A normal structure of the teacher contingent should assume the form of a pagoda, but now it is "a few at each extreme, the majority in the middle." There are few professors, also few assistant professors, but an especially large number of lecturers (including newly promoted associate professors) and thus they do not form a proper echelon formation. Because of the number of supernumerary personnel, more young teachers cannot be kept on and as a result the teacher contingent gets older and older without being supplemented by younger men. If no effective measures are taken in the next few years to remedy this problem, it is bound to create serious consequences for higher education. The gap in succession shows not only in numbers but also in quality. Some courses that must

be taught lack the teachers that can teach them, and some such courses are just left blank. The most important problem is the pressing need to raise the professional level of the large number of middle-aged and young teachers. Apart from this, there are also the problems of "heavy load of teaching and research, low salaries, heavy family responsibilities, poor conditions of health," which urgently await solutions.

In the building of our teacher contingent, I believe two questions must be effectively solved: One is the question of selection and the other of training. Many foreign scholars are of the opinion that the principal concern in developing S&T must be the selection of men, but qhite a few of our universsities still disregard this question. As to the selection of talents, the methods of the West German Max Planck Society are worth being taken as reference. The first step is to examine the senior university students. Half of the heads of research institutes and scholars at the Max Planck Society simultaneously teach at the university. Through their teaching activities, symposia and presiding over examinations, they are able to discover hopeful "sprouts," whom they then transfer to the research institutes and let them work at their sides, assisting in scientific research, where they can be further checked. The second step is to absorb some graduate students by moving them into the research institutes to write their doctoral dissertations (more than 800 are currently working on their doctoral dissertations at the Max Planck Society). These youngsters show mental agility and frequently come up with new scientific ideas, playing a very positive role in research work. The third step is to select a few of the most talented among those who have obtained their advanced degree, retain them for short terms at the research institutes, or grant them stipends, or engage them on 3- to 5-year short-term contracts. The fourth step is to again select from among all who participate in the research work the most outstanding and send them abroad for advanced studies, then bring them back to the Max Planck Soviety to serve as scholars on a long-term basis.

There are, of course, many ways to train teachers, the most fundamental being to allow them to be tempered in the instructional process and to improve themselves in scientific research. Here, I only want to discuss the problem of teacher participation in scientific research. A call by the central authorities demanded that the key universities should be centers in two respects: centers of teaching and centers of scientific research. University teachers must, therefore, be active in teaching as well as in scientific research. If a teacher is only teaching and not also doing scientific research, there will be no improvement in his teaching, and he will not be able to nurture students who will have creative capabilities. We hope the universities will link up with research institutes, establish close cooperation and jointly exert themselves in the development of our biological science and in the nurturing of talents in this field in our country.

D. The Need to Emphasize and Strengthen Biological Instruction in Middle Schools

Education must start with basic education; this is also the case with teaching biology and nurturing talents in this field. Biology is a basic course in any

normal middle school and is an indispensable organic part of middle school education. Every middle school student and every one of our educated citizens has to learn the basic knowledge of biology. From an early age, small children must be made to love the insects, fish, birds, animals, flowers, grass, trees and plants in our environment. The biological instruction in our middle schools must first of all nurture an ardent love of nature in the students and must arouse an interest in the study of nature. In the following, we shall have expression to the appeal and demands of teachers of biology, particularly with the problems that now exist in the mind and in the hope that the departments concerned will study how to resolve these problems:

1. A greater appreciation of biological instruction in middle schools; we hope the educational administrations at all levels will render the needed support by providing manpower and material resources.

2. It is suggested to increase the weekly hours of biology instruction in senior middle schools from 2 to 3 hours (the total hours from 56 to 64) and to have this instruction in the second year (it is now in the third year) of senior middle school.

3. Efforts be made to have biology teachers return to their profession and to straighten out and consolidate our contingent of biology teachers; to adopt effective means of every sort to nurture teachers and raise their proficiency.

4. Favorable conditions be created by every possible means for the establishment and improvement of biological laboratories and places for biological fieldwork; to strive energetically for the institution of classes consisting of experiments only.

5. To strengthen the buildup of teaching material for middle school biology courses, to compile as soon as possible a set of good teaching materials and reference books, rich in content and particularly attuned to the needs of our young students.

E. The Problem of Scientific Research Funds in Our Institutions of Higher Learning

To develop science and technology and nurture talents in these fields, every country in the world allots large sums every year as scientific research funds. Of these funds, agriculture, medicine and the life sciences take up a large proportion. The share by certain advanced countries of the world in these investments is more than 30 percent.

Certain comrades always regard economic construction as material production. Whether production is mentioned, they think of increasing equipment, and they do not think of developing the human intelligence or of the role of man in production. Some comrades regard education as an investment in consumption. This is a viewpoint that has long been discarded by men of insight the world over. Education can produce economic results. The level of science and education determines to a large extent the level of business management in

enterprises, of labor productivity and of the growth rate of production. The "development of intelligence" is, therefore, an indispensable condition for any accelerated development of the economy, a fact that was already expounded by many economists as early as in the sixties. Looking at the experiences of industrially advanced countries and their economic development, we see that they treated education as an important investment; the rate of its expansion always had priority over the growth of material assets. We may say, development of education is a strategic measure that takes up little of the investments in our national economy, but yields good results. Furthermore, the benefits from increased educational funds will also yield the greatest benefits from a limited investment.

9808
CSO: 4008/212

BOOKS ON MEDICAL SCIENCE TO BE PUBLISHED

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[Text] Beijing, 9 Oct (XINHUA)--China will publish the 1983 "health annual" by the end of this year.

Minister of the public health Cui Yueli is the chief editor and Qian Xinzhong, counsellor of the ministry and minister in charge of the State Family Planning Commission, is its advisor.

The 800,000-word book published by the People's Medical Publishing House includes the 1982 national health statistics, a general introduction of health institutions in China, public health work and disease prevention and treatment, traditional Chinese medicine, family planning, maternity and child health, medical education, medical apparatus, planning of health work and laws on hygiene.

An annual on Chinese medical science is being edited by leading medical specialists and scheduled to be published by the Tianjin Scientific and Technical Publishing House in the first half of 1984.

It provides information on the development of medical science in China from 1978 to 1983. It is the first of a series to be published each year.

The first edition will include articles on advances of basic medicine and clinical medicine, medical research achievements, an index of medical journals and major academic papers in China, brief accounts of medical associations, symposiums, foreign exchange activities, research units, major medical colleges as well as biographies of medical scientists.

Qian Xinzhong is its editor-in-chief, with Guo Ziheng, vice minister of public health, Wu Jieping, urologist and president of the Chinese Academy of Medical Sciences, and Zhu Xianyi, a specialist in endocrinology and advisor to the Tianjin Medical College, as deputy editors-in-chief.

CSO: 4008/3

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TITLE: "The Geological Conditions for the Formation of the Qarhan K-Mg Saline Deposits in the Qaidam Basin"

SOURCE: Beijing DIZHI LUNPING [GEOLOGICAL REVIEW] in Chinese No 3, 1983 pp 262-268

TEXT OF ENGLISH ABSTRACT: The Qarhan deposit is a Quaternary terrigenous K-Mg saline deposit dominated by interstitial brines of halite crystals, associated with such useful elements as Li and B. It is not only of major industrial value but even more of major significance in metallogenic theories. On the basis of many years of field work and with reference to relevant data of predecessors, the author puts forward the following views about the conditions for the formation of this deposit.

1. The Qaidam basin is characterized by inheritance. Prior to the Miocene, the Qilian, Kunlun and Altun mountains around the basin were still at the stage of moderate and low altitudes, and the basin was connected by water with the Tarim basin to the west and with the Gonghe basin to the east. Owing to the influence of the Himalayan movement, the Qaidam basin was gradually separated

[Continuation of DIZHI LUNPING No 3, 1983 pp 262-268]

from the other basins and became as it is. The zone of saline sediments is distributed in NWW and NNW directions, coinciding to the trends of the Kunlun Mountains to the south and the Qilian Mountains to the north, which in the main reflects the configuration of the basement uplift and depression of the basin. On account of the influence of the basement structures, the basin is divided into the eastern and western parts. The eastern is a subsidence zone as well as a zone with potash salt concentration, while the western part is an erosion zone as well as a source area of potash supply for the eastern part.

2. The sedimentary environment of the basin was originally favorable for potash accumulation, thus leading to the formation of the Qarhan K-Mg saline deposit. Later, with the development of the basin, the lake water was cut up in place into several parts, thus affecting the concentration of potash. As a result of eastward migration, the lake water was far from the potash source--the western part of the basin--thus losing an important source of potash supply.

3. Potash is derived from multiple sources, especially Tertiary saline clastic sediments, oilfield water, salt crusts or salinized soil resulting from capillary and underground brines. On the other hand, though the metamorphic and magmatic rocks surrounding the basin contain potash minerals, they have certain limitations in acting as a potash source in a limited geological period as they were weathered slowly under arid and cold climatic conditions.

[Continuation of DIZHI LUNPING No 3, 1983 pp 262-268]

4. In general the arid climate in the basin was favorable for the formation of a potash deposit. But as the climate was extremely arid in the western part of the basin after Pliocene and Pleistocene times, there was a lack of water media necessary for the continuous eluviation and transportation of K ions, thus restricting the supply of potash in the western part of the basin to Qarhan.

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TITLE: "Classification and Genesis of Mineral Associations in Hydrothermal Uranium Deposits of China"

SOURCE: Beijing DIZHI LUNPING [GEOLOGICAL REVIEW] in Chinese No 3, 1981 pp 220-226

TEXT OF ENGLISH ABSTRACT: The mineral association of hydrothermal uranium deposits refers to mineral associates formed from contemporaneous hydrothermal activity, including various minerals formed before and after hydrothermal evolution.

The characteristics of the mineral associations in hydrothermal uranium deposits depend mainly on the chemical properties of hydrothermal solutions and the physical-chemical characteristics of host rocks. Based on different effects of host rocks on the formation of the mineral associations in different structural types, the mineral associations may be grouped into two major types, the metasomatic and vein-filling types; based on the characteristics of the mineral

[Continuation of DIZHI LUNPING No 3, 1983 pp 220-226]

associations, specific mineral associations may be further distinguished; finally based on typomorphic minerals, the names of individual mineral associations may be determined.

The discussion of the conditions for the formation of mineral associations of hydrothermal uranium deposits is based on the chemical and physical conditions for forming typomorphic minerals and the relationships between typomorphic minerals. The analysis and comparison of the main mineral association of hydrothermal uranium deposits in China show that each mineral association is the consequent product of uranium-bearing hydrothermal solutions of specific composition under concrete geochemical conditions. A systematic study of the formation conditions of different mineral associations and their relationships will help to study the regularities governing the transportation and concentration of uranium in the process of formation of hydrothermal uranium deposits.

CSO: 4009/2

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TITLE "The Quality of Two Electronic Components Authenticated"

SOURCE: Beijing BIAOZHUNHUA TONGXUN [STANDARDIZATION JOURNAL] in Chinese
No 7, 1983 p 3

ABSTRACT: The China Electronic Component Quality Authentication Commission was established in 1981 and given the authority to test the quality of electronic products according to strict domestic or uniform international standards before certifying their quality and reliability. Since then, with the support of all concerned, a set of inspection and appraisal methods has been enacted and a laboratory established. Most recently, the color picture tube and the NPN high frequency triode made by Shijiazhuang Radio Plant No 2 and state-operated Jiangnan Radio Equipment and Materials Plant respectively had undergone quality tests there before certificates were issued to attest their quality. Since the adoption of uniform international standards for electronic components, the quality certification of a product has meant that its quality has reached the international level. All products thus qualified are listed in the handbook to become recommended products for domestic users and export companies.

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TITLE: "National Military Products Standardization Work Conference Held"

SOURCE: Beijing BIAOZHUNHUA TONGXUN [STANDARDIZATION JOURNAL] in Chinese
No 7, 1983 p 40

ABSTRACT: The Commission of Sciences, Technology, and Industry for National Defense called the national standardization work conference in Beijing in late April and more than 150 persons representing nuclear, aeronautic, electronic, ordnance, aerospace, shipbuilding industries, navy, air force, etc., leaders in charge of standardization work, State Planning Commission, State General Standards Bureau, and departments of finance, machinery, metallurgy, petroleum, chemical industry, and light industry attended the conference. Following discussions of experiences and principles, the two documents of "Rules of Standardization Management of the Military" and "Outline of Development of Standardization of the Military" and some related systems were passed by the conference.

6168
CSO: 4009/222

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TITLE: "The 1982 National X-Ray Diffraction Conference Held in Shanghai"

SOURCE: Beijing WULU [PHYSICS] in Chinese No 7, Jul 83 p 422

ABSTRACT: The 1982 National X-Ray Diffraction Conference was held in Shanghai on 15-20 December; the 272 delegates of the 153 organizations included some specialists of the older generation but the majority were young and middle-aged scientists and teachers. New advancements in major branches of X-ray diffraction technology here and abroad of the past two decades were summarized. Dandong Instrument Plant and 11 other manufacturers were invited to exhibit their products which included microcomputer controlled X-ray diffraction instruments, stress testing instruments, new X-ray sources, and other equipment to demonstrate China's important achievements in the field in recent years. The delegates believed that while emphasizing theoretical and experimental studies of the field, it is also important to stress technical service so as to make greater contributions to current economic construction. Some officers of the specialty committee were elected. With the approval of the Society of Physics, the Sichuan Provincial X-Ray Diffraction Cooperative Group was assigned the task of preparing for the next national X-ray diffraction conference to be held in Sichuan in November 1985.

AUTHOR: None

ORG: None

TITLE: "Brief Report by Symposium on Work Concerning the History of Physics"

SOURCE: Beijing WULI [PHYSICS] in Chinese No 7, Jul 83 pp 447, 389

ABSTRACT: For the purpose of promoting the work of teaching, popularizing, and studying the history of physics, the China Society of Physics held a symposium in Beijing on 9-11 April 1983. Participants included 43 delegates of 31 organizations of Beijing, Tianjin, Guangzhou, Wuhan, Hefei, Changchun, Jinzhou, Shijiazhuang, Xi'an, and Baoding. Progress of research on the history of physics in foreign countries was introduced. The delegates reported the status and experience of work of this field in the various areas and pointed out the very uneven development in the country as a whole. It was unanimously agreed that 1) under the direction of the society, a liaison group should be established in Beijing to coordinate the work; 2) Publishers should be asked to compile and translate important literature and classics on the history of physics to provide inspiring and interesting reading materials for the youth of the country; and 3) Local societies should launch a broad spectrum of activities including lectures to help physics teachers of local colleges and middle schools popularize the subject. A lecture series, lasting 10 days, is planned by the society for the fourth quarter of this year for teachers of basic physics courses and fields other than physics in colleges and industrial schools to acquaint them with the history of physics.

6248
CSO: 4009/5

END